

Amendments to the Claims:

1 1. (Deleted).

1 2. (Currently Amended) The mass analyzer of claim 15, wherein the electron filament is
2 configured to generate electrons when heated in an electric field of less than 70
3 volts per centimeter.

1 3. (Currently Amended) The mass analyzer of claim 15, wherein the electron filament is
2 configured to generate electrons when heated in an electric field of less than 50
3 volts per centimeter.

1 4. (Currently Amended) The mass analyzer of claim 15, wherein the electron filament is
2 configured to generate electrons while a background pressure in the source is
3 greater than 1.0×10^{-4} Torr.

1 5. (Currently Amended) A mass analyzer comprising an electron source, the electron
2 source including:
3 an electron filament coupled to an electrical supply, the electron filament
4 including a conductive wire or conductive ribbon, the electron filament
5 configured to generate electrons when heated and configured to generate
6 electrons while a background pressure in the source is greater than $1.0 \times$
7 10^{-5} Torr;
8 a plurality of nanofilaments disposed on the surface of the electron filament; and

9 a filament body for positioning the electron filament relative to a mass filter~~The~~
10 mass analyzer of claim 1, wherein the electron filament is configured to
11 generate electrons while a background pressure in the source is greater
12 than 1.0×10^{-5} Torr.

1 6. (Deleted)

1 7. (Currently Amended) A mass analyzer comprising an electron source, the electron
2 source including:
3 an electron filament coupled to an electrical supply configured to pass a current
4 through the electron filament;
5 a plurality of nanofilaments disposed on the surface of the electron filament;
6 a filament body for positioning the electron filament relative to a mass filter; and
7 a magnetic field configured for directing electrons generated using the electron
8 filament. ~~The mass analyzer of claim 6, wherein the means for directing~~
9 ~~electrons is a magnetic field.~~

1 8. (Currently Amended) A mass analyzer comprising an electron source, the electron
2 source including:
3 an electron filament coupled to an electrical supply configured to pass a current
4 through the electron filament;
5 a plurality of nanofilaments disposed on the surface of the electron filament;
6 a filament body for positioning the electron filament relative to a mass filter; and
7 means for directing electrons generated using the electron filament;

8 ~~The mass analyzer of claim 6~~, wherein the electron source is configured such that
9 the directed electrons are accelerated to an energy of approximately 70
10 electron volts.

1 9. (Currently Amended) The mass analyzer of claim 67, wherein the nanofilaments
2 include carbon nanotubes.

1 10. (Currently Amended) The mass analyzer of claim 68, wherein the nanofilaments
2 include boron.

1 11. (Currently Amended) The mass analyze of claim 67, ~~wherein the~~ wherein the electron
2 source is configured to generate electrons for electron capture ionization.

1 12. (Currently Amended) The mass analyzer of claim 68, wherein the electron source is
2 configured to generate electrons for electron impact ionization.

1 13. (Currently Amended) The mass analyzer of claim 67, wherein the electron source is
2 configured to generate electrons for chemical ionization.

1 14. (Currently Amended) The mass analyzer of claim 67, wherein the electron source is
2 configured to generate electrons for ion fragmentation.

1 15. (Currently Amended) The mass analyzer of claim 68, wherein the electron filament is
2 a ribbon or wire.

1 16. (Currently Amended) The mass analyzer of claim 67, further including a mass filter.

1 17. (Currently Amended) The mass analyzer of claim 68, further including a sample
2 source.

1 18. (Deleted).

1 19. (Currently Amended) The filament assembly of claim 1820, wherein the electron
2 filament is a wire or a ribbon.

1 20. (Currently Amended) A filament assembly comprising:
2 an electron filament coupled to an electrical supply configured to provide a
3 current through the electron filament and to hold the electron filament at a
4 potential of approximately 70 Volts relative to part of an electron source;
5 a plurality of nanofilaments disposed on the surface of the electron filament; and
6 means for positioning the electron filament.~~The filament assembly of claim 18,~~
7 ~~wherein the potential is approximately 70 Volts.~~

1 21. (Original) An analysis system comprising:
2 an electron filament coupled to an electrical supply configured to pass a current
3 through the electron filament and to hold the electron filament at a
4 potential of approximately 70 Volts relative to an other part of the analysis
5 system, the electron filament including a conductive wire or conductive
6 ribbon, the electron filament configured to generate electrons when
7 heated;
8 a plurality of nanofilaments disposed on the surface of the electron filament;

9 a filament body for positioning the electron filament relative to the other part of
10 the analysis system;
11 means for directing electrons generated using the electron filament;
12 a mass filter configured to filter ions generated using the generated electrons; and
13 an ion detector configured to detect the filtered ions.

1 22. (Original) The analysis system of claim 21, further including a chromatograph
2 configured to introduce a sample to the mass filter.

1 23. (Original) The analysis system of claim 21, further including a second mass filter
2 configured to introduce a sample to the mass filter configured to filter ions
3 generated using the generated electrons.

1 24. (Original) A method of analyzing a sample comprising:
2 generating electrons with energy of approximately 70eV, using an electron
3 filament coupled to an electrical supply configured to pass a current
4 through the electron filament and to hold the electron filament at an
5 approximate potential, the electron filament including a conductive wire or
6 conductive ribbon, the electron filament further including a plurality of
7 nanofilaments disposed on the surface of the electron filament;
8 causing the generated electrons to contact the sample;
9 ionizing the sample using the generated electrons, to produce ions;
10 separating the produced ions; and
11 detecting the separated ions.

1 25. (Currently Amended) The method of claim 24, wherein the ~~separation~~separated ions
2 are separated in time.

1 26. (Original) The method of claim 24, wherein the produced ions are produced using
2 chemical ionization.

1 27. (Original) The method of claim 24, further including maintaining a background
2 pressure greater than 1×10^{-5} Torr.

1 28. (Deleted)

1 29. (Currently Amended) The method of claim 2830, further including generating the ion
2 using a mass filter.

1 30. (Currently Amended) A method of analyzing a sample comprising:
2 generating electrons using an electron filament coupled to an electrical supply
3 configured to pass a current through the electron filament and to hold the
4 electron filament at an approximate potential, the electron filament
5 including a conductive wire or conductive ribbon, the electron filament
6 further including a plurality of nanofilaments disposed on the surface of
7 the electron filament;
8 causing the generated electrons to contact an ion in a region with a background
9 pressure of greater than 1×10^{-4} Torr;
10 fragmenting the ion using the generated electrons, to produce an ion fragment;
11 filtering the produced ion fragment; and

12 | ~~detecting the filtered ion fragment. The method of claim 28, wherein the generated~~
13 | ~~electrons are caused to contact the ion in a region with a background~~
14 | ~~pressure of greater than 1×10^{-4} Torr.~~

1 31. (Original) A filament assembly comprising:

2 an electron filament configured to be coupled to an electrical supply for providing
3 a current through the electron filament and for holding the electron
4 filament at a potential relative to part of an electron source; and
5 a plurality of nanoparticles disposed within the electron filament.

1 32. (Original) The filament assembly of claim 31, wherein the nanoparticles are
2 configured to modify grain boundaries within the electron filament.

1 33. (Original) The filament assembly of claim 31, wherein the nanoparticles include
2 polyhedral oligomeric silsesquioxane.

1 34. (Currently Amended) The filament assembly of claim 31, wherein the nanoparticles
2 include a silicon compound of the chemical composition ~~shown in FIG. 7~~
3 $\text{Si}_8\text{O}_8\text{R}_8$.

1 35. (Deleted).

1 36. (Original) The filament assembly of claim 31, further including means for
2 positioning the electron filament relative to a mass filter.

1 37. (Original) The filament assembly of claim 31, wherein the potential relative to part
2 of an electron source is approximately 70 Volts.

1 38. (Original) The filament assembly of claim 31, further including means for
2 positioning the electron filament relative to an electron gun.

1 39. (New) The mass analyzer of claim 8, further including a mass filter.

1 40. (New) The mass analyzer of claim 8, wherein the nanofilaments include carbon
2 nanotubes.

1 41. (New) The mass analyzer of claim 7, wherein the electron source is configured to
2 generate electrons for electron impact ionization.